Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	**)**	
	)	
Amendment of Parts 2 and 97 of the Commission's	**)**	**RM-11785**
Rules Regarding Implementation of the Final Acts	**)**	
of the World Radiocommunication Conference	**)**	
(Geneva, 2015) To Allocate the Band 5351.5 - 5366.5	**)**	
kHz to the Amateur Radio Service	**)**	

To: The Commission

COMMENTS OF ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.405(a) of the Commission's Rules [47 C.F.R. § 1.405(a)], hereby respectfully submits its comments in response to the *Public Notice*, Report No. 3071, released February 16, 2017 (the Notice). The Notice called for comments from interested parties on ARRL's above-captioned *Petition for Rulemaking* (the Petition) within 30 days of the Notice. The Petition proposes to amend Section 2.106 of the Commission's Rules and several sections of Part 97 of the Commission's Rules as proposed in the Appendix submitted with the Petition, so as to implement domestically that portion of the Final Acts of the 2015 World Radiocommunication Conference ("WRC-15")[1] that provided for the international allocation of the band 5351.5 - 5366.5 kHz to the Amateur Radio Service on a secondary basis. For its comments, ARRL states as follows:

[1] WRC-15 Final Acts, (Geneva, 2015).

1. There are as of this writing just over 60 comments filed in response to ARRL's Petition. All of them were filed by individual Amateur Radio licensees. They all support an allocation to the Amateur Service of a contiguous band in the vicinity of 5 megahertz. They are all in agreement with ARRL that a contiguous band in the vicinity of 5 MHz will assist in conducting emergency and disaster relief communications in the United States; with the Caribbean basin; with Alaska and with other parts of North, Central and South America. Some of the comments filed to date propose the elimination completely of channelized operation in that frequency range, and instead suggest a conversion to what they describe as the "European model"[2] for this allocation in the United States, which they describe as being considerably larger than the 15 kHz worldwide, secondary frequency allocation at 5351.5 - 5366.5 kHz for the Amateur Service agreed upon at WRC-15. Many of the commenters also recommend that the Commission permit maximum power levels on the order of 500 watts, one kilowatt or 1.5 kilowatts PEP output power, which is considerably higher than that proposed in ARRL's Petition.

2. Other commenters suggest the opposite: that, regardless of the allocation to the Amateur Service of a contiguous band domestically, only channelized operation within that band should be permitted. A few comments propose that no telegraphy or telephony operation should be allowed within the allocation. Instead, they argue, only data emissions should be permitted in this band so as to encourage more regulated, spectrum-efficient and reliable operation in furtherance of emergency

[2] The commenters who urge the allocation of a band larger than the WRC-15 international allocation seem to be under the impression that a large number of European countries in International Telecommunication Union (ITU) Region 1 have collectively implemented domestically some expanded band. Such is not the case. See paragraphs 4 and 5 hereinbelow. However, those requests for an allocation larger than 15 kilohertz of bandwidth are both reasonable and understandable, given the longstanding and often-acknowledged need for a band of between 50 kilohertz and 150 kilohertz. See, ARRL's *Petition for Rule Making*, RM-10209, Public Notice (rel. Aug. 13, 2001) Report No. 2501 (noting a bandwidth requirement for an Amateur allocation of at least 150 kilohertz); [2] *See also* Department of Commerce, *U.S. National Spectrum Requirements: Projections and Trends*, NTIA Special Publication 94-31, March 1995 (Noting, at page 168 that, with respect to a new Amateur allocation near 5000 kHz, the requirement "is for about 50 kHz near 5 MHz, on a shared basis. Particularly desirable for communications during solar cycle minima when maximum usable frequencies are below 3.5 MHz."
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and disaster relief communications. Most comments in any case acknowledge the absence of reported interference to Federal government users or anyone else resulting from Amateur operation on the five current, discrete channels permitted on a secondary basis pursuant to Section 97.303(s) of the Commission's rules.

3. A fair summary of the comments filed to date, therefore, is that they universally support the allocation of a contiguous band to the Amateur Service; that they in general support a power level in excess of the maximum radiated power of 15 Watts (e.i.r.p.) permitted by the Final Acts of WRC-15; and they note that the band is most useful for emergency and disaster relief communications between, for example, the continental United States and the Caribbean basin. There is, however, an absence of consensus with respect to the appropriate size of the contiguous allocation; the proper status going forward of the discrete channels that are in regular daily use now that are outside the international allocation at 5351.5 - 5366.5 kHz; and the proper power limit to be permitted domestically for this allocation in particular. While ARRL understands and agrees that there is a long-term, justifiable need for an allocation at 5 MHz that is larger than the 15 kHz made available at WRC-15, and there is a very practical need for power in excess of the 100 watts PEP requested in ARRL's Petition, there are practical considerations inherent in the ARRL Petition that stem from an urgent and ongoing need to share the Amateur allocation compatibly with other, primary users. The Amateur Service must, of necessity, avoid interference to the primary users of this band (which it has, to date) in order to be permitted to operate there. ARRL's Petition recited the history of its decades-long effort to obtain a contiguous band near 5 MHz. This history demonstrates that there is not really much room for debate about the size of the band and the power limit domestically at the present time, given the allocation status of the band (domestically and internationally) and the necessary interference protection requirements for primary users. It is hoped that as regular Amateur operation in this contiguous band

develops, with the operating parameters recommended in ARRL's Petition, such operation will continue to demonstrate compatible sharing with Federal and other users and the operating parameters and the band can be re-examined and adjusted equitably at a later time.

4. First, with respect to the size of the band, Agenda Item 1.4 of WRC-15 included a modification to the International Table of Allocations to add a secondary allocation in all three ITU Regions to the Amateur Service of the band 5351.5-5366.5 kilohertz. Remaining primary in that band internationally were the fixed and mobile services (except aeronautical mobile). While the most recent NTIA spectrum needs evaluation for the Amateur Service cited a requirement[3] for about 50 kilohertz in the vicinity of 5 MHz, that volume of spectrum simply did not prove available on a worldwide basis. Domestically, NTIA has twice expressed concern about a contiguous allocation at 5 MHz, given the significant number of Federal government primary assignments in the frequency range at issue and the need for immediate access to the spectrum from time to time. There are apparently numerous Federal government assignments in this frequency range for various agencies, including assignments to agencies with homeland security responsibilities, and those assignments must be available in real time, without interference. ARRL's Petition fairly noted that there has been over the past fifteen years, and there is now, a need for limits on Amateur use of spectrum in this range, and the need to exercise great care and vigilance by Amateur Radio operators using the discrete channel allocations in this band. This is necessitated given the secondary status of Amateur Radio in this band and the absolute need to protect fixed and mobile services, including Federal assignments, at all times.

5. There is no universally available, wider band in Europe. The band 5351.5-5366.5 kilohertz proposed for domestic implementation is a worldwide international allocation. With very few

[3] *Id.*, Department of Commerce, *U.S. National Spectrum Requirements: Projections and Trends*, NTIA Special Publication 94-31, March 1995. *See also* Department of Commerce, *High Frequency Spectrum Planning Options*, NTIA Special Publication 96-332, November 1996.

exceptions, countries in ITU Region 1 that have implemented this allocation have authorized the WRC-15 band at 5351.5-5366.5 kilohertz. Based on information obtained in February from the International Amateur Radio Union (IARU), countries that have implemented the WRC-15 allocation include Andorra, Belarus, Belgium, Denmark, Finland, Germany, Ireland, Luxemburg, Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. Of these countries, only Denmark, the Netherlands and Norway have domestically expanded on the WRC-15 allocation and have included varying amounts of additional spectrum between 5250 and 5450 kilohertz. Hungary has permitted its radio Amateurs to use the band 5350-5450 kilohertz. No country in ITU Region 2 (the Americas) has implemented in the vicinity of 5 MHz an Amateur allocation other than the WRC-15 allocation to date. Thus, there is no "European model" for a larger contiguous band near 5 MHz. Increasingly, however, administrations are making available worldwide that which was allocated internationally at WRC-15.

6. ARRL agrees with those comments that suggest that there remains after WRC-15 an unmet need for a larger domestic allocation to the Amateur Service than the 15 kilohertz of contiguous spectrum proposed in ARRL's Petition. However, in ARRL's view there is an urgent need to deploy the 15-kilohertz WRC-15 allocation at 5351.5-5366.5 kilohertz at the earliest possible time; to retain for continued Amateur use the four discrete channels now available pursuant to Section 97.303(s) that are outside that 15 kilohertz allocation; and to demonstrate to NTIA and to the Commission in practice that there remains an entirely compatible sharing arrangement that will, at the same time: (1) expand the ability of radio Amateurs to provide reliable communications (especially between the United States mainland and the Caribbean basin) to provide emergency and disaster relief communications; and (2) protect and permit immediate access to frequencies in the band by Federal

agencies, once amateur operations have been established. Once the evidence of compatible sharing is developed, further expansion of this allocation domestically can and should be revisited.

7. The second issue about which there is no consensus in the comments to date is the disposition of the individual channel allocations after the allocation of a contiguous band near 5 MHz. ARRL's Petition requested that the Commission, while implementing 5351.5-5366.5 kHz, also retain for continued Amateur use four of the five channels[4] currently authorized, and that the Commission retain the service rules governing Amateur use of those channels without change. There are now well-established, Amateur Radio operating protocols and networks of stations using the current five channel allocations, and the service rules in the six years following their enactment have proven to be beneficial to Amateur Radio disaster relief communications and also sufficient to avoid interference to primary users. It is best too, during the initial years of operation in the band 5351.5-5366.5 kHz, to allow Amateur use to develop slowly in the contiguous band, so as to ensure, as ARRL is firmly convinced, that the interference avoidance mechanisms now in place with the discrete channels will work equally well in the contiguous band. It is believed that some or all of the established emergency preparedness networks that currently meet on the four channels outside the contiguous band will wish to continue to do so for the indefinite future in any case.

8. It is understood that radio Amateurs are uncomfortable with channelized operation at high frequency (HF). It is not at all the most efficient means of spectrum utilization using narrow bandwidth emissions. However, in implementing the contiguous WRC-15 allocation, there are good and sufficient reasons, itemized above and in ARRL's Petition, for maintaining as well the four channels that are outside that contiguous band. At the same time, efficient spectrum utilization in a

[4] ARRL's Petition requests that the current rules with respect to the channels centered at 5332 kHz, 5348 kHz, 5373 kHz and 5405 kHz be retained without change pursuant to Footnote US23 and the existing service rules. The channel 5358.5 kilohertz is subsumed within the new band allocation at 5351.5 – 5366.5 kHz.

Service that utilizes signals of varying emissions and bandwidths requires the allocation of a contiguous band, not only on channels with arbitrary limits on capacity that are less than what the state of the technology permits. Both can be had without increasing the risk of interference to primary users. Dynamic frequency selection by licensees as an interference avoidance mechanism in this band in particular has proven successful for 15 years. Listen-before-transmit is at this point a "given" when operating on individual channels, and it will be necessary when operating in the contiguous band as well.

9. Finally, with respect to the power limit for the contiguous band, ARRL urges the Commission in the strongest possible terms to permit United States radio Amateurs to utilize up to 100 watts ERP, with reference to a 0 dB/d gain antenna.[5] It is precisely that power level that is imposed to date on the five discrete channels at 5 MHz and that power level has very recently been found to be appropriate for Amateur operation. Those who suggest that significantly higher power should be permitted because, for example, we are nearing the Solar cycle's minimum and communications will require higher power levels make a valid point. The high noise levels in the lower HF bands during the summer months and especially during hurricane season necessitates the use of higher power from time to time. While power levels of 500 watts PEP output, or even a kilowatt or more can easily be justified in terms of communications reliability, the other side of the equation, once again, is the indisputable need to protect the primary allocation holders against interference. The WRC-15 Final Acts specifically identified a power limit for the 60-meter band of 15 watts effective isotropic radiated power (e.i.r.p.). Imposition of this power limit domestically is unnecessary as a matter of interference avoidance, and it defeats the

[5] Some commenters expressed concern that no antenna other than a zero dBd antenna could be used on the five channels now allocated. In fact, the power limit now in place allows use of a higher gain antenna but with a resultant power reduction so as to maintain parameters below the maximum permitted ERP. There is no gain limitation in the rules now governing the five discrete channels and there should not be such under the rules governing the contiguous band.

premise for the allocation.[6] For precisely the same reasons that the Commission consented to a power increase on the five channels as recently as 2011, the Commission should permit a power level of 100 watts PEP (assuming use of a 0 dBd gain antenna), in the contiguous 60-meter band. The WRC-15 power limit would render the band unsuitable for emergency and public service communications, especially between the United States mainland and the Caribbean basin during the summer storms and hurricane seasons when high levels of atmospheric noise are present. A power limit of 15 watts e.i.r.p. is indisputably insufficient to permit reliable communications on the paths that are most critical. On the other hand, the comments filed to date urging maximum power limits significantly higher than 100 watts do not provide a factual basis on which to assert compatibility with primary allocation holders. In 2011, the Commission stated, with respect to the power level appropriate for the five discrete channels at 5 MHz[7] as follows:

> We agree … that the current power limitation of 50 W PEP hinders communications and that a small amount of additional power would make it easier for amateur users to communicate in the band…We believe that the examples cited by the twelve commenters above offer compelling reasons to support our tentative conclusion that an increase in maximum power would serve to facilitate many amateur radio communications with minimal risk of harmful interference.

Thus, the use of 100 watts PEP with reference to a 0 dBd gain antenna was found by the Commission to facilitate Amateur Radio communications with "minimal risk of harmful interference." Experience since then with 100 watts PEP has been interference-free operation. Therefore, with this as a predicate, and with due regard for the valid concerns expressed in numerous comments that higher power are necessary under some conditions, it is recommended that initially, the appropriate power level for the contiguous

[6] The output of 15 watts e.i.r.p. under the WRC-15 result equates to roughly 9 watts e.r.p. into a half wave dipole as a reference antenna. This potential reduction of more than 10 dB in the authorized output of a United States Amateur Radio station is inadequate for all but the most robust digital communication modes under ideal propagation conditions. It is not at all adequate for the regional public service, emergency, and inter-service communications upon which amateurs, partner and served agencies, and those they serve have come to rely.

[7] *Amendment of Parts 2 and 97 of the Commission's Rules to Facilitate Use by the Amateur Radio Service of the Allocation at 5 MHz,* 26 FCC Rcd. 16551 at 16555 (2011).

60-meter band in the United States should be 100 Watts PEP output. Greater power is easily justifiable in terms of the need to ensure communications reliability during varied propagation conditions, but it is not as easily justifiable from the perspective of protecting primary users from harmful interference.

10. ARRL continues to support its proposal for the implementation of the result of WRC-15 by allocating the band 5351.5 - 5366.5 kHz to the Amateur Radio Service on a secondary basis; retaining the four discrete channels at 5 MHz that are outside the proposed contiguous allocation; authorizing all amateurs of General Class or above to use the contiguous band; and adopting the power limit now applicable to the five channels at 5 MHz for the contiguous band. Each component of this proposal is intended to maximize spectral efficiency by permitting amateurs to operate throughout a band as conditions and availability warrant; to give primary service operations certainty as to where radio Amateurs will be located within the broader fixed and mobile service band between 5250 – 5450 MHz; and it protects those primary users with the same successful interference avoidance techniques and protocols that have been used for the past 15 years domestically, with which radio amateurs have the technical training and experience to comply. ARRL urges adoption of the WRC-15 result by the rule changes proposed in the Appendix at the earliest possible time, if at all possible in advance of the 2017 hurricane season.

Therefore, the foregoing considered, ARRL, the national association for Amateur Radio, hereby respectfully requests that the Commission issue a Notice of Proposed Rule Making at the earliest possible date, proposing the regulatory changes set forth herein and in the attached Appendix.

Respectfully submitted,

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